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### WHEAT STREAK MOSAIC VIRUS

Wheat Streak Mosaic Virus (WSMV) has been observed in many wheat fields in Northwest and Northcentral North Dakota this year. WSMV is primarily a disease of wheat and can infect winter wheat, spring wheat, and durum. Other small grains including barley, rye, and oat are susceptible to WSMV. WSMV is a viral disease that is transmitted by the wheat curl mite, *Aceria tosichella*. The earlier wheat plants are infected with the virus, the greater the yield loss that can be expected. If wheat plants are infected late in development, e.g., heading or later, very little yield loss is expected; infection at flag-leaf to heading can incur yield loss of 20% or less; and infection during emergence and tillering can result in complete yield loss and crop failure.

Symptoms of WSMV often appear first at the edges of fields or in patches next to volunteer wheat. Mites can either blow in on the wind to infect field edges or overwinter in volunteer wheat and spread out from there. The characteristic symptom of WSMV is yellow streaking of individual leaves. Leaves have broken yellow lines (streaks) running parallel to the veins. As the disease develops, more leaf area turns yellow and leaves take on a mottled appearance. Eventually, yellow leaves turn brown and die. Severely infected plants are stunted and entire fields can appear yellow and stunted if disease incidence is high. To confirm WSMV, an Enzyme Linked Immunosorbent Assay (ELISA) is used. The [NDSU Plant Diagnostic Laboratory](#) offers ELISA testing for confirmation of WSMV.

### WHY IS WSMV A PROBLEM THIS YEAR?

WSMV tends to occur in areas where both winter and spring wheat are grown because the mites that transmit WSMV need a continuous source of green, living plants to survive. When spring wheat is planted next to winter wheat, mites can easily move from the winter wheat as it matures to the neighboring spring wheat. In spring wheat and durum fields, volunteers from last year allow mites to survive. Normally, our harsh winters kill volunteer spring wheat and durum that germinate after harvest. However, the winter of 2015 to 2016 was unusually mild. A lot of volunteer wheat survived and was able to host the mites right



Photo credits. Top: Mary Burrows, MSU;  
Middle: William M. Brown Jr., bugwood.org;  
Bottom: Erik Stromberg, Virginia Tech

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# Ag Alert

Northwest North Dakota

up until the 2016 spring wheat and durum crops were planted. This provided perfect conditions for very early infection of the 2016 spring wheat with WSMV. I think this is why we are seeing both greater occurrence and severity of WSMV this year.

## HOW DO I GET RID OF WSMV?

There are no insecticides labeled for control of the wheat curl mite and fungicides do not control WSMV. **Good sanitation will be the key to controlling WSMV in future crops!** Before planting 2017 spring wheat or this fall's winter wheat, eliminate all volunteers and grassy weeds **at least two weeks** before planting wheat. Grassy weeds such as cheat grass and Japanese brome can be alternative hosts for mites. Waiting a full two before planting after killing volunteer wheat/ grassy weeds is needed to "break the green bridge" of living hosts that the mite needs to survive. Another strategy to avoid WSMV is to plant winter wheat during the recommended planting window of September 1-15 in the northern half of North Dakota. Later dates within this window are more likely to have cooler temperatures which slow down the mite's life cycle. For spring wheat, early planting is recommended to minimize the risk of WSMV. Mite populations increase during warm weather and early planting gives the wheat a chance to establish and develop before the mites are abundant. Remember, the later wheat is infected with WSMV, the lower the potential for yield loss.

Another management option to control WSMV is **crop rotation**. Rotating a field to a broadleaf crop the year after WSMV is found in wheat will eliminate the crop host for the mite. Planting a broadleaf crop and prioritizing grassy weed control for one or two years after WSMV is an excellent strategy for eliminating both the grassy weeds and volunteer wheat that could harbor mites.

## ATTEND SUMMER FIELD TOURS

- Williston Research Extension Center      July 14  
Dryland agronomy & horticulture tours at 9 am CST  
Afternoon pulse crop production & marketing session  
2.0 Montana private pesticide applicator credits
- Nesson Valley Research Farm      July 15  
Irrigated crop tour starts at 9 am CST  
23 miles east of Williston on Hwy 1804  
1.0 Montana private pesticide applicator credit

